CHAPTER 3

GENDER AND PERFORMANCE IN ACCOUNTING COURSES DURING AND AFTER SHOCK PERIODS

Hossein Nouri and Maria S. Domingo

ABSTRACT

Female students comprise a significant number of the accounting student population at four-year institutions. Likewise, a significant number of students have chosen to enroll and earn associate degrees at a community college, and subsequently transfer to a four-year college or university. According to the National Center for Education Statistics, more than half of the students enrolled in two-year institutions were female. Moreover, 57% of college students in the United States are females. This study provides empirical evidence on the interaction between gender and transfer versus native accounting students in their academic performance during and after shock periods. According to the literature, the shock period includes two semesters after a two-year college student transfers to a four-year college. The results of this study indicate that female and male transfer students do not perform equally in their accounting courses compared to their native counterparts, that is, male transfer students in accounting performed worse than female transfer students and native students (male and female) both during and after the “shock” period. These findings may have practical implications for administrators and accounting departments since male transfer students appear to need more assistance to absorb transfer shock when they join four-year colleges and possibly even after their first year at the four-year institution.

Keywords: Transfer student; gender; accounting education; community college; academic performance; shock period
Over the past several decades, the number of female accounting graduates in the United States has steadily increased in a formerly male dominated academic environment and profession (Moore, 2013). In 1977, the American Institute of Certified Public Accountants (AICPA) reported that only 28% of accounting students were females (McInnes & Sanders, 1988). However, the number of female accounting students rose to 50% by 1985 (McInnes & Sanders, 1988). More recently, in 2011–2012, the AICPA reported that 45.6% of students enrolled in an accounting program were female (Moore, 2013). In the United States, a significant number of accounting students choose to begin their higher education at a community college (rather than enroll directly at a four-year institution), and subsequently transfer to a four-year college or university to pursue a bachelor degree (Wirt et al., 2003). The National Center for Education Statistics (NCES) in the United States reported that approximately 31% of students enrolled in institutions of higher learning attend two-year community colleges (Table 303.25, NCES, 2017b), and approximately 57% of the students enrolled in two-year institutions were female (Table 303.70, NECS, 2017c).

Almost 2% of associate degrees conferred by postsecondary institutions were in Accounting (Table 321.10, NCES, 2017a). Approximately 45% of all accounting majors at four-year colleges or universities have attended a two-year community college “at some point,” and 16.4% of all accounting majors at four-year colleges or universities have earned an associate degree at a community college (American Accounting Association, 2010). Furthermore, 56.8% of accounting students at four-year institutions (non-doctoral) were female and accounting students at two-year institutions were far more likely to be female than male, that is, approximately 70% were female in 2008 (American Accounting Association, 2010).

Many scholars have studied the theory of “transfer shock” by comparing the differences in academic performance (i.e., grade point average (GPA)) between transfer and native students. Hill (1965) first labeled “transfer shock” as the temporary dip in grades that transfer students may experience during the first and second semesters after transfer to a four-year college or university. Studies have found that transfer students had lower GPAs than their native student counterparts in their first year (Bahr, Toth, Thirolf, & Massé, 2013; Best & Gehring, 1993; Laanan, 2001; Peng & Bailey, 1977), but showed improvement as they became acclimated with the academic and campus environment of the four-year institution (Best & Gehring, 1993; Cohen & Brawer, 1989; Xu, Jaggars, Fletcher, & Fink, 2018). Most transfer students bounced back from the effects of transfer shock within a year from transfer (Diaz, 1992; Domingo & Nouri, 2016; Schmidt & Wartick, 2013; Xu et al., 2018).

Despite the findings of prior studies, we do not know if transfer shock and the academic performance of accounting students during and after shock periods are affected by gender. In addition, prior transfer shock studies encourage multiple studies of various institutions of higher education because of lack of generalizability in this line of research (e.g., Schmidt & Wartick, 2013). This study differs from prior studies about transfer shock as follows. First, in contrast to prior studies that examined this issue by combining the gender of transfer and native students to examine its effect on performance in introductory and upper-level
accounting courses (e.g., Fogarty & Goldwater, 2010; Gist, Goedde, & Ward, 1996), our study examines the interaction effect between gender and transfer students versus native students on the academic performance of accounting courses during and after shock periods. Second, the current study’s statistical method uses two composites GPA for the accounting classes during the shock period (the second accounting course, Intermediate Accounting I and Cost Accounting) and after the shock period (all other accounting courses starting Spring of Junior year) and a three-way mixed analysis of covariance (ANCOVA) with a priori contrast coding. Third, prior studies were conducted at four-year institutions located in different geographical regions than the current study. Fourth, the study’s institution has selective admissions (incoming freshmen’s average Scholastic Aptitude Test (SAT) score in this study is 1,270 for critical reading and math only), smaller class sizes (15–25 students in this study for upper-level class sizes) of primarily full-time students, predominantly white students (99%) under 25 years old (99%), and notably requires all accounting majors (native and transfer students) to take the second accounting principles course at the institution. Finally, full-time faculty taught the upper-level accounting courses in our study and there was no change in the faculty that taught Intermediate I and II, Cost Accounting, Auditing and Advanced Accounting over the study’s test period.

This study argues that because male transfer students are less likely to ask for help and/or utilize support services, they are more academically vulnerable than female transfer students and their native student counterparts during and after the shock periods. It is important for administrators, counselors, and accounting faculty to understand how gender differences can impact the academic outcomes of accounting transfer students in comparison to their native counterparts (Ewert, 2012; Leppel, 2002; Sax, 2008).

In this study, accounting courses during transfer shock period include the Second Accounting Principles Course, Intermediate Accounting I, and Cost Accounting, and after shock period include all other upper-level accounting courses. Therefore, we ask whether gender differences impact accounting course performance of transfer students during and after shock periods in comparison to their native student counterparts. The term “native” is used to describe students who began their higher education at a four-year college or university from day one. The main effect that this study examines is the gender effect on the academic performance of native versus transfer accounting students. In other words, does the gender influence the accounting course performance of native versus transfer students during and after shock periods? We will argue that male transfer students are more academically vulnerable (i.e., perform worse academically) than female transfer students and their native student counterparts during and after shock periods because male transfer students may find it more difficult to academically and socially integrate in the four-year institution than female transfer students (Ewert, 2012; Leppel, 2002; Sax, 2008).

We illustrate this point with empirical data on the effect of gender differences in the academic performance of accounting students enrolled at a liberal arts undergraduate college in the Northeast United States during and after shock periods over a four-year academic period. Consistent with the prior literature, the
current study uses a two-semester posttransfer window as its definition of shock period throughout the chapter. During shock period in this study is defined as the second semester of the second year and the first semester of the third year at the four-year college. After shock period is defined as the second semester of the third year and the first and second semesters of the fourth year at the four-year college.

The findings of this study show that female and male transfer students do not perform equally in their accounting courses compared to their native counterparts, that is, male transfer students in accounting performed worse in this study when they were compared to female transfer students and their native counterparts.

The remainder of this chapter is organized into four sections. The next section provides the literature review and related hypotheses, followed by the methods and results sections. The last section presents the conclusion, limitations, and practical implications of the findings.

**LITERATURE REVIEW**

In this section, we review gender differences between native and transfer students in the accounting major and establish the current study’s theoretical framework based on the theories of academic and social integration (Tinto, 1975). A number of studies have examined the effect of academic integration and social integration on students’ persistence and learning outcomes in higher education (Nora, Cabrera, Hagedorn, & Pascarella, 1996; Tinto, 1993).

Academic integration is the level to which a student believes he or she is meeting the explicit academic standards of the college or university as well as that individual’s identification with the beliefs, values, and norms inherent in the academic system (Tinto, 1975). (Jones, 2010, p. 688)

Social integration is “the level of congruency between a student and the social system of a college or university” (Jones, 2010, p. 688).

At the community college-level, studies have revealed that academic integration and social integration were interconnected (Chapman & Pascarella, 1983) and strengthened by information networks among students, faculty, support services, or campus resources (D’Amico, Dika, Elling, Algozzine, & Ginn, 2014; Karp, Hughes, & O’Gara, 2010; Lester, Brown Leonard, & Mathias, 2013). Although many community college transfer students experience difficulty adjusting to the academic rigor, campus environment, and competition among students after transfer to a four-year institution (Laanan, 2007; Townsend & Wilson, 2006), academic skills combined with college know-how may contribute to the transfer students’ success (Lester et al., 2013) more so than their social sphere (Berger & Malaney, 2003; D’Amico et al., 2014; Lester et al., 2013). Next, the literature review focuses on transfer shock and the gender gap in higher education and then more specifically among accounting majors.

**Gender and Academic Performance in Higher Education**

Studies have found that academic and social integration influences the gender gap in college persistence and institutional commitment (Leppel, 2002; Sax, 2008).
Gender differences in higher education have attracted the attention of scholars as females continue to make strides in college admissions and completion, and have exceeded males in certain areas (Buchmann & DiPrete, 2006; Fortin, Oreopoulos, & Phipps, 2015; Hadjar, Krolak-Schwerdt, Priem, & Glock, 2014; Kessels, Heyder, Latsch, & Hannover, 2014; Spinath, Eckert, & Steinmayr, 2014; Wolfe & Williams, 2014). In particular, researchers have found that males are more likely to experience academic issues than females and seem to struggle more in higher education (Kahn, 2009; Kahn, Brett, & Holmes, 2011; Wolfe & Williams, 2014). Researchers have suggested that “sociocultural factors” influence the behavior of male students in higher education (Harris & Harper, 2008). Many male students may associate the processes which promote academic success (e.g., reading, writing, studying) with femininity (Archer, Pratt, & Phillips, 2001; Harris & Harper, 2008; Kahn, 2009). Although vital to a transfer student’s academic success according to the social and academic integration theories (discussed above), many male students are reluctant to participate in campus organizations, develop meaningful relationships, or seek help from support services of campus resources when needed because they view such actions as feminine, have difficulty or unwillingness to convey their feelings, or refuse to show emotional vulnerability (Harris & Harper, 2008; Kahn, 2009).

Prior research findings, however, have produced mixed results concerning transfer shock by gender. While Harris and Harper’s (2008) findings for community college students and Kahn et al.’s (2011) study of male subjects indicate higher academic performance of female students versus male students, Ewert (2012) found higher academic performance of male students who participated in sports. Ewert (2012) also found that male students were less academically integrated in college than female students as evidenced by the male students’ lower grades and, therefore, less likely to graduate. Additionally, more female transfer students from two-year institutions who transferred to four-year institutions persisted to graduation than male transfer students (Ewert, 2012).

Carlan and Byxbe (2000) examined multiple majors (including business majors) and found the transfer shock effect but no gender effect of transfer students. The study used multiple regression analysis to analyze a sample of transfer students and native students over a three-year period at one university (see Table 1). The study found that business majors experienced worse transfer shock (than the study’s other majors such as liberal arts, the arts, education, and psychology) and their grade differential between transfer and native students did not completely recover over the passage of time. Carlan and Byxbe (2000) found no gender effect for transfer students of the combined majors in the study (i.e., the study did not examine the gender effect of business students separately).

Gender and Performance in Accounting Courses

In accounting, several researchers have conducted empirical studies that compare the performance of female students to male (combined transfer and native students) in Accounting Principles I and II and/or upper-level accounting courses within a single institution or several institutions over varied periods of time (see Table 1 for a summary of the related research). Some studies found no difference
<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanks and Shivaswamy (1985)</td>
<td>The data consisted of 435 accounting students (229 male, 206 female) in 17 different cost accounting sections over a two-year period.</td>
<td>The authors found that although female students outperformed male students in the study, the difference was not statistically significant.</td>
</tr>
<tr>
<td>Mutchler et al. (1987)</td>
<td>A longitudinal study of data collected from one male instructor’s auditing class over an 18-year period (1961–1978). The data consisted of 1,815 students (12.7% female, 87.3% male).</td>
<td>The authors found that females consistently outperformed male students on average.</td>
</tr>
<tr>
<td></td>
<td>The data (Spring 1984–1985) from 10 instructors (five males and five females) in three universities consisted of 1,110 students (469 females and 641 males) in upper-level accounting courses.</td>
<td>The authors found again that females consistently outperformed male students on average.</td>
</tr>
<tr>
<td>Canlar and Bristol (1988)</td>
<td>The data consisted of examination grades of accounting students (212 females and 246 males) in upper-level courses at one institution in the Northeast from Fall 1983 through 1985.</td>
<td>The authors found no significant difference in performance between females and males.</td>
</tr>
<tr>
<td>Tyson (1989)</td>
<td>The data consisted of approximately 200 students (2:1 ratio of males to females) enrolled in the introductory-level accounting courses at a northern US university.</td>
<td>The author found that females for all class levels outperformed males in all courses, including introductory accounting courses.</td>
</tr>
<tr>
<td>Buckless et al. (1991)</td>
<td>The data consisted of exam scores, SAT scores, and high school GPAs for 1,807 students (840 females and 967 males) enrolled in three introductory and one upper-level accounting classes at three state institutions.</td>
<td>The study’s initial findings suggested that student gender differences affected performance and an interactive effect sometimes occurred with instructor gender. However, after the researchers controlled for general academic aptitude (SAT or ACT scores), the authors concluded that there was no statistically significant difference in performance between females and males.</td>
</tr>
<tr>
<td>Doran et al. (1991)</td>
<td>The data consisted of 552 (30% females and 70% males) Accounting Principles I students (nine sections) and 434 (44% females and 56% males) Accounting Principles II (5 sections) students during one semester in 1987. Doran et al. notes “that only a relatively small percentage of the students in each course were accounting majors (10% in Accounting Principles I and 26% in Accounting Principles II).”</td>
<td>The authors found that male students significantly outperformed female students in the first accounting principles course, but not the second principles course.</td>
</tr>
</tbody>
</table>
Carpenter et al. (1993) The authors conducted a study on the effects of race, gender, and expectations on academic performance. The data consisted of 1,086 students (517 females and 569 males) in the introductory accounting principles course at three institutions during the fall semester of 1989. Although the authors found minority students were more likely to withdraw from the introductory courses, the authors found no statistically significant gender difference in academic performance and attrition rates.

Gist et al. (1996) The data consisted of 127 students (44.9% females and 55.1% males) during a Spring semester for students enrolled for the first time in Accounting Principles I at “an historically Black university on the East Coast.” The authors found no significant gender difference in the academic performance of minority students of a principles accounting course.

Laband et al. (1997) The data consisted of 221 two-year college transfer students in comparison to 2,073 native students in upper-level accounting courses at two Mid-Atlantic universities from 1987–1995, and included gender as part of the study’s determinants of performance. The authors found that female students outperformed male students in accounting principles classes and upper-level accounting courses after controlling for general academic aptitude.

Carlan and Byxbe (2000) The data consisted of 487 transfer students (327 females and 160 males) compared to 230 native students (136 females and 94 males) in various majors including business at a university in the southern United States from 1989 to 1991. The study included gender as a variable. The authors found that gender did not contribute significantly to the study’s transfer student GPA prediction model.

Fogarty and Goldwater (2010) The data consisted of 108 students (54 females and 54 males) enrolled in an upper-level management accounting course for the Spring of 2008 semester at a state university in the Southeastern United States. The study gathered data from an impartial computer-based testing system that included self-testing practices, quizzes, and exams, but no credit was given for homework or attendance. The authors found that female students did not significantly outperform male students in this academic environment.

Schmidt and Wartick (2013) The data was obtained from student records for designated courses within a 10-year period beginning in the Summer semester of 2,000 and ending in the Spring semester of 2010. The designated courses included principles of financial accounting, principles of managerial accounting, and upper-level accounting courses. The authors found that female students performed significantly worse than male students in intermediate accounting I and cost accounting; no significant performance difference between male and female students in the intermediate accounting II, auditing, and income tax courses; and female students outperformed male students only in accounting information systems.

Domingo and Nouri (2016) The data consisted of 29 transfer students (14 females and 15 males) compared to 206 native students (96 females and 110 males) in the second principles course and upper-level accounting classes at a four-year institution in the Northeast. The authors found no statistically significant gender effect.
between female and male students on accounting course performance during and after shock (Buckless, Lipe, & Ravenscroft, 1991; Canlar & Bristol, 1988; Carpenter, Friar, & Lipe, 1993; Fogarty & Goldwater, 2010; Hanks & Shivaswamy, 1985), while others either found that female students outperformed male students (Laband, Rosenberg, & Smith, 1997; Mutchler, Turner, & Williams, 1987; Tyson, 1989) or male students outperformed female students (Doran, Bouillon, & Smith, 1991; Schmidt & Wartick, 2013). The studies, however, have combined gender of native and transfer students and yielded conflicting and inconclusive results.

Specifically, the following studies directly compare the academic performance of transfer students to native students in accounting.

**Studies With Neither a Transfer Shock Effect nor Gender Effect**

Prior studies of accounting students in intermediate accounting found neither a transfer shock effect nor a gender effect (Bernardi & Bean, 1999; Delaney, Keys, Norton, & Simon, 1979; Eikner & Montondon, 2001; Montondon & Eikner, 1997). These studies are limited in that they examined the transfer shock effect in only one upper-level accounting course (intermediate accounting) and did not measure for a postshock effect. Colley, Volkan, Drucker, and Segal (1996) used regression analysis to compare the academic performance of transfer students who transferred from “junior level institutions” and majored in accounting with that of their native student counterpart. The study measured the transfer students’ success in intermediate accounting and all other upper-level accounting courses (finding partial transfer shock) and suggested that transfer students’ accounting principles grades (from a two-year institution) are not equivalent to those of native students. The study, however, is limited in that it did not test for gender nor include control variables.

**Studies Finding Transfer Shock Effect and Perhaps a Gender Effect**

Prior studies have directly compared the academic performance of transfer students versus native students in all upper-level accounting courses (Domingo & Nouri, 2016; Laband et al., 1997; Schmidt & Wartick, 2013). Laband et al. (1997) used regression analysis to measure the academic performance of transfer students in upper-level accounting classes in comparison to their native student counterparts at two Mid-Atlantic universities. The study found that although the mean GPA of transfer students for accounting principles classes was higher (from their two-year institution) than for native students, the native students outperformed the transfer students in the upper-level accounting classes. Notably, Laband et al. (1997) deleted the first semester’s grades of all transfer students in their study’s calculation of GPA in the upper-level accounting classes (dependent variable). Therefore, the study removed part of the transfer shock period (the first semester) while the second semester was averaged with other upper-level accounting grades. Although Laband et al. (1997) does not measure the effect of transfer shock, the study found that female students (combined transfer and native students) performed better than male students in the upper-level accounting courses.
Prior studies have found a transfer shock effect in their comparison of the academic performance of transfer students versus native students (Domingo & Nouri, 2016; Schmidt & Wartick, 2013). Schmidt and Wartick (2013) conducted their study at a university in Iowa and used group mean t-tests and regression analysis to analyze eight upper-level accounting courses. The study found that native students outperformed transfer students in the upper-level accounting courses, that is, not only during the shock period but for all remaining courses. Although the transfer students narrowed the performance gap in intermediate accounting II, accounting information systems, auditing, and income tax suggesting that transfer shock lessened in later semesters, the transfer shock did not entirely disappear. Domingo and Nouri (2016) used a one-way multivariate analysis of covariance and t-test to analyze upper-level accounting courses over a four-year period at a four-year institution in the Northeast. The study found that native students outperformed transfer students in intermediate accounting I, cost accounting, and advanced accounting. Furthermore, the transfer students failed to recover their GPAs in upper-level accounting courses in comparison to their native counterparts. Both studies found a transfer shock effect; however, the studies found no statistically significant gender effect or the results were inconclusive for gender (see Table 1).

A major limitation of these studies is that they combine the gender of transfer and native students to examine its effect on performance in introductory and upper-level accounting courses. Therefore, the findings of these studies could be subject to confounding effects. To overcome this shortcoming and gap in the literature, the current study directs its attention toward the interaction effect of gender and transfer students versus native students on the academic performance of accounting courses during and after shock periods. For this purpose, the current study uses two composites GPA for the accounting classes during the shock period and after the shock period and a three-way mixed ANCOVA with a priori contrast coding (Laerd Statistics, 2019).

Based on the findings of academic and social integration studies, including the development of information networks, we posit that male transfer students are less likely to ask for help and/or utilize support services and integrate into the college life. Therefore, they are more academically vulnerable than female transfer students and their native student counterparts to perform academically in accounting courses during and after shock periods. Accordingly, this study examines the following hypotheses, stated in alternative forms:

\( H1 \). During the “shock” period, there is an interaction between gender and transfer versus native students affecting performance in accounting courses (2nd Accounting Principles Course, Intermediate Accounting I, and Cost Accounting).

\( H2 \). For the semesters after the third semester of transfer (i.e., after shock period), there is an interaction between gender and native versus transfer students affecting performance in upper-level accounting courses.
METHOD

The subjects of this study were graduates of a liberal arts undergraduate college in the Northeast United States over a four-year period (2010–2013). The college is a selective college with a current average SAT score of 1270 (critical reading and math only) for entering freshmen. The number of accounting graduates each year is between 60 and 70 students. In this study, accounting courses during transfer shock period include the Second Accounting Principles Course, Intermediate Accounting I, and Cost Accounting, and after shock period include Intermediate Accounting II, AIS, Federal Income Tax, Advanced Accounting, Auditing, and Accounting Capstone.

During the time period of this study, the accounting department graduated 246 students of which 39 were transfer students. The final sample for this study was 222, which was determined as follows:

<table>
<thead>
<tr>
<th>Eliminated students because of:</th>
<th>Native</th>
<th>Transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer from other four-year colleges</td>
<td>207</td>
<td>2</td>
</tr>
<tr>
<td>Outliers (not a typical student)</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>No SAT scores</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Not taking all courses at the four-year college</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>195</td>
<td>27</td>
</tr>
</tbody>
</table>

Of the total subjects, 102 were female (93 native and 9 transfer students), and 120 (102 native and 18 transfer students) were male students. The students were predominantly white students (99%) and under 25 years old (99%). Descriptive statistics for average accounting course grades for the shock and after shock periods are presented in Table 2 for each gender and native versus transfer students.

Although the number of transfer students in this study is low (15.9%), it is close to the national average of 16.4% of accounting majors at four-year institutions who earned an associate degree at a community college (American Accounting Association, 2010). Läuter (1978) reports that for four groups, two dependent variables, alpha of 0.05, and beta of 0.05, the minimum sample size

<table>
<thead>
<tr>
<th>Table 2. Descriptive statistics of Average Accounting Course Grades.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Shock period</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>After shock period</td>
</tr>
</tbody>
</table>

Note: The data in Table 2 is presented as a continuation of the text and not as a standalone table.
per cell is seven subjects, which is satisfied in this study. The data for this study were extracted from student transcripts. We obtained Institutional Research Board approval for conducting this study.

**Variable Measurements and Statistical Analyses**

Students must complete 10 accounting courses to graduate with a degree in accounting at the college where this study is conducted. The first accounting principles course at the four-year college was mainly taught by adjunct faculty and included all business students. The second accounting principles course at the four-year college consisted of two separate courses, that is, one for accounting students and one for all other business students. The second accounting principles course that accounting students were required to take included managerial accounting for half of the semester and the first five chapters of intermediate accounting. It is important to note that all transfer students in accounting must complete the second accounting principles course at the four-year college even though the transfer student already completed a second accounting principles course at a community college.

We computed two composites GPA for the accounting classes during the shock period (the second accounting course, Intermediate Accounting I, and Cost Accounting) and after the shock period (all other accounting courses starting Spring of Junior year) Using composites of multiple grades rather than individual grades has two advantages. First, it makes our testing more parsimonious and reduces the likelihood of including chance occurrences in the analysis. Second and more importantly, composites of multiple grades will be substantially more reliable than single grades (Beatty, Walmsley, Sackett, Kuncel, & Koch, 2015). The shock period composite GPA (three accounting courses) and the after shock period composite GPA (six accounting courses) had reliability Coefficients Alpha of 0.848 and 0.842, respectively. Information for gender, native versus transfer, and grades for different accounting courses were extracted from student transcripts. For students who took a course multiple times, the grade when they took the course for the first time was included in the analyses.

The study hypotheses were tested using mixed ANCOVA with a priori contrast coding. In particular, a three-way mixed ANCOVA (with one within-subjects and two between-subjects factors) was employed (Laerd Statistics, 2019) to determine the effects of native versus transfer and gender on composite accounting GPAs during the shock and after shock period. Consistent with recommendations in the prior literature, we used a priori contrast coding (Buckless & Ravenscroft, 1990; Rosenthal & Rosnow, 1985; Schmitt, 1988). Furthermore, three-way mixed ANCOVA gives one overall test of the equality of mean vectors for the four groups in this study, but it neither shows which group differ from which other groups on their mean vectors nor indicates which variables are responsible for the differences in mean vectors. These problems can be overcome with a priori contrast coding. In performing the analyses, native students were coded one and transfer students two, and females were coded zero and males were coded one.

The use of a three-way mixed ANCOVA requires that four assumptions are met. The results of testing assumptions are presented in Table 3.
RESULTS

SAT total (math and verbal) was used as covariate to control for students’ general academic aptitudes.\(^1\) Tests of within-subject effects based on Pillai’s Trace\(^2\) are presented in Table 4. Tests of between-subjects effects are presented in Table 5.

The results in Table 4 show that there is a significant difference in accounting course grades between the shock period and after the shock period (Shock), \(F(1, 217) = 4.715;\) Pillai’s Trace = 0.021, \(p = 0.031.\) The results further show that there are no statistically significant differences between native and transfer students as well as between male and female students during the shock and after shock period on their accounting course grades. Finally, the results of within-subject analysis show that there is a statistically significant three-way interaction between shock, gender and native versus transfer students, \(F(1, 217) = 5.036,\) \(p = 0.026,\) partial \(\eta^2 = 0.184.\) The results of between subject effects in Table 5 show that there is an interaction between gender and native versus transfer students on average accounting course grades \((F = 4.719, p = 0.031).\)^3

Table 3. Assumptions Underlying ANCOVA.

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Type of Test</th>
<th>Results</th>
<th>Action Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>No outliers</td>
<td>Box-Plot</td>
<td>Two outliers for native female and three outliers for native male students.</td>
<td>These were deleted from the study since they were not a typical student (extreme poor and good performance and not graduating in four years).</td>
</tr>
<tr>
<td>Normality of dependent variable</td>
<td>Shapiro-Wilk test</td>
<td>This assumption was only violated for native female students for after shock accounting GPA.</td>
<td>No Action taken because of robustness of ANOVAs to deviations from normality.</td>
</tr>
<tr>
<td>Homogeneity of variances and covariance matrices</td>
<td>Levene’s test of equality of variances and Box’s M</td>
<td>During the shock GPA scores ((p = 0.162)) and after shock GPA scores ((p = 0.890)). Homogeneity of covariance matrices ((p = 0.314)).</td>
<td>Assumptions are satisfied.</td>
</tr>
<tr>
<td>Sphericity</td>
<td>Barlett test of sphericity</td>
<td>The intercorrelations between the two periods was significant ((r = 0.759, p &lt; 0.001)).</td>
<td>There was no high multicollinearity among the two composite GPAs (i.e., a correlation of more than 0.9).</td>
</tr>
</tbody>
</table>

Table 4. Tests of Within-Subject Effects.

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>(F)</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHOCK</td>
<td>0.021</td>
<td>4.715</td>
<td>1.000</td>
<td>217.000</td>
<td>0.031</td>
</tr>
<tr>
<td>SHOCK * SAT</td>
<td>0.008</td>
<td>1.703</td>
<td>1.000</td>
<td>217.000</td>
<td>0.193</td>
</tr>
<tr>
<td>SHOCK * N_VS_T</td>
<td>0.000</td>
<td>0.001</td>
<td>1.000</td>
<td>217.000</td>
<td>0.443</td>
</tr>
<tr>
<td>SHOCK * GENDER</td>
<td>0.003</td>
<td>0.590</td>
<td>1.000</td>
<td>217.000</td>
<td>0.977</td>
</tr>
<tr>
<td>SHOCK * N_VS_T * GENDER</td>
<td>0.023</td>
<td>5.036</td>
<td>1.000</td>
<td>217.000</td>
<td>0.026</td>
</tr>
</tbody>
</table>

Statistics is based on Pillai’s Trace.
To gain further insight into the differences among cells in Table 2, univariate test with contrast coding was performed. The results are presented in Table 6 and Figs. 1 and 2.

The findings in Table 6 show that the multivariate test for contrasts are statistically significant for native female versus transfer male ($V = 3.121, p = 0.046$), and native male versus transfer male ($V = 4.466, p = 0.013$), but no statistically significant results between other groups. Next, we performed univariate tests to examine differences in groups during and after shock period. The findings of univariate test in Table 6 indicate that during “shock” period, both female and male native students as well as female transfer students performed better than transfer male students on composite average accounting course grades (shown in bold values in Table 6). These findings support Hypothesis 1 and indicate that there is an interaction between gender and transfer versus native students affecting performance in accounting courses (composite grade of second Accounting Principles Course, Intermediate Accounting I, and Cost Accounting). Fig. 1 depicts these results. Interestingly, female transfer students performed better than both female and male native students during the “shock” period, although not statistically significa
The same results are also true for average of all accounting course grades. These findings indicate that male transfer students had more difficulty integrating academically and socially at the four-year college and coping with changes from the community college during the shock period.

**Fig. 2.** Interaction Effect After Shock Period.

**Table 6.** Contrast Coding Results of Gender and Native Versus Transfer Students on Average Accounting Course Grades During Shock and After Shock Periods.

<table>
<thead>
<tr>
<th>Contrast</th>
<th>Univariate Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shock Period</td>
</tr>
<tr>
<td></td>
<td>$F$</td>
</tr>
<tr>
<td>Female, native versus male, native</td>
<td>2.250</td>
</tr>
<tr>
<td>Female, native versus female, transfer</td>
<td>0.648</td>
</tr>
<tr>
<td>Female, native versus male, transfer</td>
<td>4.739</td>
</tr>
<tr>
<td>Male, native versus female, transfer</td>
<td>0.043</td>
</tr>
<tr>
<td>Male, native versus male, transfer</td>
<td>8.852</td>
</tr>
<tr>
<td>Female, transfer versus male, transfer</td>
<td>4.459</td>
</tr>
</tbody>
</table>

Notes: $F$ test for accounting courses are based on df(1, 217). Pillai’s trace multivariate test is based on df(2, 216).

significant. The same results are also true for average of all accounting course grades. These findings indicate that male transfer students had more difficulty integrating academically and socially at the four-year college and coping with changes from the community college during the shock period.
After the “shock” period, female and male native students outperformed male transfer students. These findings indicate that the after “shock” is still evident for transfer male students, even after the first year at the four-year college. These findings support Hypothesis 2 and show that there is an interaction between gender and native versus transfer students affecting composite grades of upper-level accounting courses. Fig. 2 shows these results.

Overall, the results and findings in Fig. 3 show that male transfer accounting students perform worse than other groups of accounting students both during the “shock” and after the “shock” periods, although they also have improvements in their grades after the “shock” period.

CONCLUSION AND LIMITATIONS

This study has examined whether there is an interaction between gender and transfer versus native students in their performance of accounting courses during and after shock periods. The results indicate that there is an interaction between gender and native versus transfer students on average accounting course grades, that is, during the “shock” period, both female and male native students as well as female transfer students performed better than male transfer students on the composite average accounting course grades and the average of all accounting course grades. These findings indicate that male transfer students had more difficulty integrating academically and socially at the four-year college and coping with changes from the community college during the shock period. This conclusion is in line with research that found males are more likely to experience academic issues than females (Kahn, 2009; Wolfle & Williams, 2014) as well as
research that points to gender differences in social and academic integration (Ewert, 2012; Leppel, 2002; Sax, 2008). After the “shock” period, female and male native students outperformed male transfer students. Contrary to prior research in transfer shock, these findings indicate that the after “shock” is still evident for transfer male students, even after the first year at the four-year college. Overall, the results show that male transfer accounting students performed worse than other groups of accounting students both during the “shock” and after the “shock” periods, although they also had more improvements in their grades after the “shock” period. The findings of this study may also explain the inconsistent results of prior gender “transfer shock” studies as those studies combined gender of native and transfer students to do their analyses.

This research challenges the notion that transfer shock is a temporary dip in grades during the first and second semesters after transfer to a four-year college or university. We find support that “transfer shock” is still evident for transfer male students, even after the first year at the four-year college, on some upper-level accounting courses. This research suggests that male transfer students are more academically vulnerable than female transfer students and their native student counterparts during and after shock periods. A plausible explanation for the divergent academic outcomes is that male transfer students may find it more difficult to academically and socially integrate (e.g., form meaningful relationships, seek help) in the four-year institution than female transfer students. In particular, male transfer students in accounting may need more support to ease their transition to the four-year institution and continued support thereafter. Therefore, administrators, counselors, and accounting faculty at four-year institutions should consider the gendered effects of transfer students at four-year institutions when designing educational support and mentoring programs which could have profound effects on academic outcomes.

This study is subject to several limitations. First, this study examined a sample of accounting major students from a single institution. Therefore, the findings may not be generalizable to other students in different fields of study nor other institutions, except for four-year institutions in similar environments as the current study institution. Students in this study were all full-time students. Other four-year institutions with part-time students, with flexible schedules, or state mandated articulation processes may find different results. Future studies can examine if the findings of this study apply to other fields of study or other four-year colleges different than the one in this study. Second, the length of the study is over a four-year period, which may not be sufficient to examine the accounting education experience of community college transfer students in comparison to native students who fulfill all of their accounting course requirements at a four-year institution. In particular, the number of transfer students was limited and low in the current study. Even with these limitations, an intriguing gender difference in male transfer students was observed in this study. Additional research is needed to examine if the findings of this study holds with a larger number of transfer students. Furthermore, we have provided empirical data (i.e., grades) on the gender effect of transfer students in comparison to their native student counterparts, but qualitative research in a future study is better equipped to more
thoroughly address the social consequences of transfer shock. Third, this study does not control for a measure of social or academic integration of transfer students that accounts for the gender effect. For example, a measure of transfer student involvement in student organizations could be included as social integration factor. Future research should consider including factors related to social and academic integration to better understand the gender effect. Finally, this study also does not include measures of parental socio-economic status and parental education on performance of students. Future studies may want to consider these factors on comparing gender effect of transfer and native students.

Notwithstanding these limitations, the findings of this study contribute to the current literature about transfer students. This chapter finds that the performance of accounting transfer students from a two-year institution to a four-year institution is affected by gender, and establishes the ongoing need for discourse in accounting education. In particular, the results of this study show that female and male transfer students do not perform equally compared to their native counterparts. Female transfer students performed better than male transfer students in this study when they were compared to their native counterparts. Interestingly, female transfer students performed better than both female and male native students during the “shock” period, although not statistically significant. Future studies can further examine this interesting result. These findings may have practical implications for administrators and accounting departments since male transfer students seem to need more assistance to absorb “transfer shock” and integrate academically and socially when they join four-year colleges and quite possibly even after their first year at the four-year institution. In addition, the findings of this study may explain the conflicting results of prior gender studies in the performance of accounting courses. That is, based on the results of the current study, combining female and male transfer students with female and male native students in prior studies to examine gender effect could have affected the results by finding significant, non-significant, or no difference in accounting course performance between male and female students. Future studies may further investigate this issue.

NOTES

1. We ran a three-way mixed ANOVA without the covariate SAT score (total of math and verbal). The total sample size was 233 (95 native and 16 transfer female students and 103 native and 19 transfer male students). The results of Multivariate test were essentially the same as those reported in this paper. Therefore, the results with SAT as covariate are reported in this study.

2. There are several tests available for multivariate test. We reported Pillai’s Trace as all tests provided the same results.

3. To check the robustness of our results, we tested for only the first course taken during the Shock period (Principles II), Intermediate I, Intermediate I and Cost, and the two course taken after the shock period (Intermediate II and AIS). There was a significant interaction between gender and native versus transfer for Accounting principal II ($F = 4.80, p < 0.05$), for Intermediate Accounting I ($F = 5.29, p < 0.05$), and for Intermediate Accounting I and Cost Accounting ($F = 5.79, p < 0.05$). There was no significant interaction for Accounting Intermediate II and AIS ($F = 3.17, p > 0.05$).

4. The data were not available for this study.
REFERENCES


